

Validation of OCO-2 and ACOS-GOSAT using HIPPO and TCCON

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Consistent validation of satellite CO₂ estimates is a prerequisite for using multiple satellite CO₂ measurements for joint flux inversion and establishing a long-term atmospheric CO₂ data record. We validate recent satellite observation of OCO-2 v7 and ACOS-GOSAT v7.3 using similar analysis as previous work (Kulawik et al. (2016) and Frankenberg et al. (2106)) through comparisons to the HIPPO Pole-to-Pole Observations (HIPPO) and the Total Carbon Column Observing Network (TCCON) to estimate biases and errors affecting the understanding of carbon cycle science. CarbonTracker RT is also compared to the validation data, and additionally used to evaluate the mismatch between the HIPPO observation timeframe and the OCO-2 record, which are offset by 3-7 years. Some key metrics that are validated include the seasonal cycle phase and amplitude, latitudinal gradient by season, regional biases, and errors with respect to averaging.